



## Study of the Prevalence of Severe Acute Malnutrition with Complications in Children Aged 6 to 59 Months at the Aguié District Hospital (NIGER)

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### Abstract

### Original Research Article

**Introduction:** Malnutrition is a pathological condition resulting from the relative or absolute deficiency or excess of one or more nutrients. It is a major public health problem in children under five years of age in low-income countries. The aim of our study was to determine the prevalence of SAM with complications hospitalised in paediatrics. **Materials and Methods:** This was a retrospective, descriptive study from 1 January to 31 December 2022 that included all records of children aged 6 to 59 months hospitalised during the study period for SAM with complications. **Results:** During the study period, we identified 2152 cases of SAM with complications, out of 5349 hospitalisations, i.e. a hospital prevalence rate of 40.23%. The marasmic form accounted for 88.9%. The 13-24 month age group was the most represented, at 39%. Males predominated, at 52.62%. The marasmic form was the most common, accounting for 89%. Peak hospitalisation was in August 16%. Diarrhoea was the most frequent reason for consultation (41.50%) and gastroenteritis the most frequent complication (45.70%). We found that 87.7% of patients were treated successfully, 2.4% dropped out and 9.1% died. **Conclusion:** SAM remains a real problem in Aguié. Raising community awareness and strengthening preventive measures will help to reduce its prevalence and mortality in the district.

**Keywords:** Acute malnutrition - complications - Aguié – Niger.

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## INTRODUCTION

Malnutrition is a pathological state resulting from the deficiency or relative or absolute excess of one or more essential nutrients, whether this state manifests itself clinically or is detectable only by biochemical, anthropometric or physiological analyses (Sommer A. P, 2010). According to the World Health Organisation

(WHO), 52 million children under the age of 5 are wasted, 17 million are severely wasted and 155 million are stunted. Undernutrition plays a role in around 45% of deaths in children under the age of 5. These deaths occur mainly in low- and middle-income countries (WHO, 2021). In Tanzania, every minute, around 10 malnourished children die - nearly 5 million every year.

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Malnutrition accounts for at least 30% of child mortality in developing countries (Ngallaba SE *et al.*, 2014). Severe acute malnutrition can take several forms: marasmus (severe emaciation), kwashiorkor (oedematous malnutrition) or the mixed form. This is the stage of malnutrition where the risk of child mortality is highest (Abate HK *et al.*, 2019).

In Niger, the nutritional situation continues to give cause for concern, with the prevalence of severe acute malnutrition in 2021 at 2.7%, which is above the emergency threshold of 2%. It is 3.8% in Maradi, the administrative region of the Aguié district (SMART 2021 REPORT). There are data on severe acute malnutrition in Niger, but none for the Aguié district hospital, hence the interest in this study, which aims to investigate the prevalence of severe acute malnutrition with complications in patients hospitalised in the paediatric ward of the Aguié district hospital.

## MATERIAL AND METHODS

Our work was carried out in the paediatrics department of Aguié district hospital. The Aguié district hospital is a first-level hospital. It serves as a referral hospital for the 11 CSIs (Integrated Health Centres) in the district and for certain hospitals in neighbouring districts that do not have a unit for the management of severe acute malnutrition with complications. This was a retrospective, descriptive study from 1 January to 31 December 2022. It took place in the paediatric ward of the Aguié district hospital. We included in the study all children aged 6 to 59 months hospitalised during the study period for severe acute malnutrition with

complications. All malnourished children aged less than 6 months and more than 59 months were excluded. The criteria for admission to the ward were those of the Niger PCIMA protocol: P/T (weight/height) ratio < -3 Z score or PB (brachial perimeter) < 115mm or presence of bilateral oedema + or ++ and poor appetite and/or presence of medical complications or presence of bilateral oedema +++ or Kwashiorkor-marasma. Weight, height and BW and assessment of nutritional oedema were done according to national protocol guidelines (PCIMA NIGER, 2016). Data were collected using an individual form from reference sheets, medical records, therapeutic sheets. The following parameters were collected: child's age, sex, mother's age, occupation, situation, level of education, residence), clinical data (reason for hospitalisation, anthropometric parameters, physical signs, associated pathologies and complications), length of stay, average weight gain and immediate outcome of the patient. Authorisation to collect the data was obtained from hospital management before the start of the study. Data entry and analysis were performed using Excel 2019.

## RESULTS

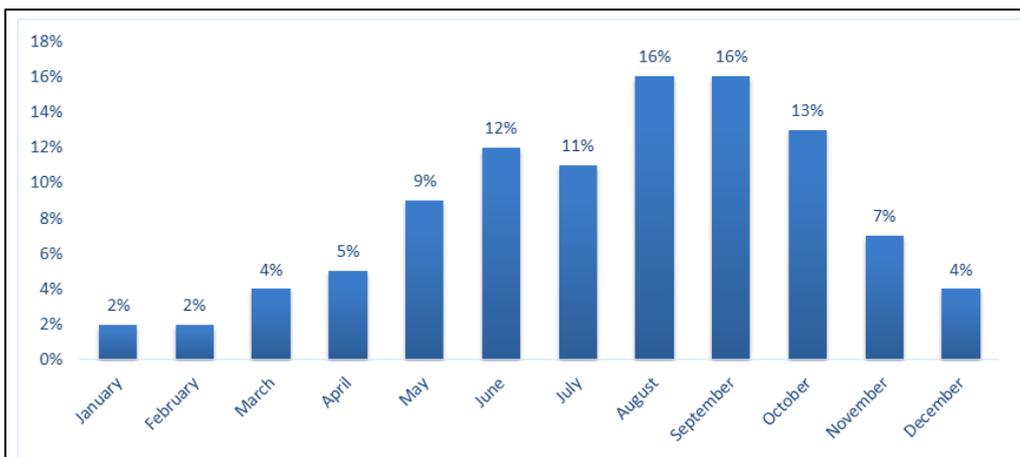
During the study period, we recorded 2,152 cases of severe acute malnutrition with complications, out of a total of 5,349 hospitalisations, giving a hospital prevalence rate of 40.23%. The Maramisque form was the most common (88.9%). The mean age was 17 months, with extremes ranging from 1 to 59 months. The 13-24 month age group was the most represented (39%). Males predominated at 52.62%, with a sex ratio of 1.10 in favour of males (Table 1).

**Table 1: Breakdown of patients by socio-demographic characteristics**

Socio- demographic characteristics	Frequency	Percentage
Sex		
Mâle	1132	52,62 %
Female	1020	47,38%
Age		
6 to 12 months	322	15%
13 to 24 months	840	39 %
24 to 36 months	516	24%
36 to 59 months	474	22 %
Screening method		
Nutritional oedema	239	11%
Brachial perimeter (BP)	650	30%
Weight for height (W/H)	1263	59%

The vast majority of patients (78%) lived outside the town of Aguié. Children of mothers who did not attend school and housewives accounted for 100% of cases. The majority of patients were admitted to the malnutrition management programme and to the ward for severe emaciation (marasmic form). In this respect,

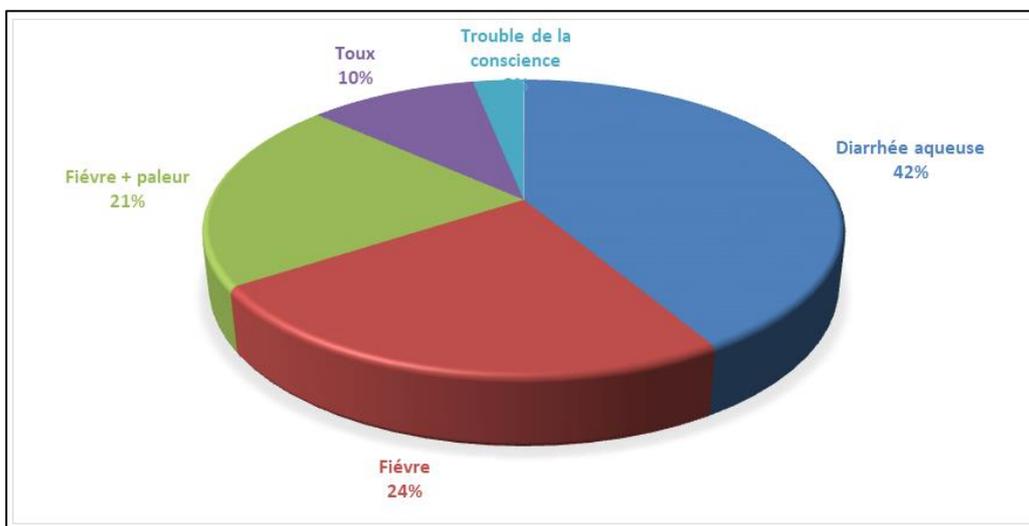
30% had a PB less than or equal to 115 mm, 59% had a P/T less than -3 Z score and 11% were admitted for nutritional oedema. Peak hospitalisation was in August and September (16% and 16% respectively), followed by October 13% (Figure 1).



**Figure 1: Breakdown of patients by month of hospitalisation**

The most common reasons for consultation were diarrhoea 41.50%, followed by fever 24.20% and pallor 22%. Of the complications encountered on

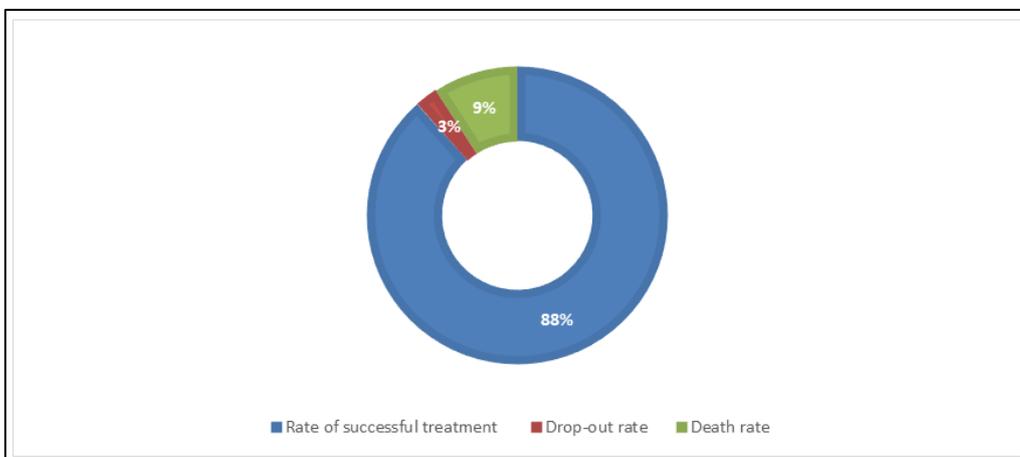
admission, gastroenteritis was the most common, accounting for 45.70% of cases (Figure 2).



**Figure 2: Breakdown of patients by reason for consultation**

In terms of progress, 88% of patients were successfully treated and sent to CRENAS for further

treatment, with 3% dropping out and 9% dying (Figure 3).



**Figure 3: Breakdown of patients by outcome**

## DISCUSSION

During our study, we found 2152 cases of severe acute malnutrition with complications out of 5349 children hospitalised in the paediatric ward, i.e. a prevalence of 40.43%. Our result is higher than that of (A Bah *et al.*, 2021) at Ségou hospital in Mali 11.30% and that of (Sangho O *et al.*); however, it is lower than that of (F Traoré *et al.*, 2020) in Nara 50% in hospital and that of 58.54% in Niamey paediatric emergency department (Sadou Kangaye *et al.*, 2019). This high prevalence in our study could be explained by the fact that it only concerned a specific SAM care service with support from partners. In our series, males were in the majority, i.e. 52.62% with a ratio of 1.10. This male predominance was found in (J. NDIE *et al.*, 2017) i.e. 51.4% and in (Bassibila Zoungrana *et al.*, 2019). The age group 6-24 months was the most represented 54%. Our result is similar to that of (J. NDIE *et al.*, 2017) 57% and (Sadou Kangaye *et al.*, 2019) 66.20% which all found a predominance of this age group. This situation could be explained by the SAM and the fact that these age groups are the most vulnerable because they also correspond to those of weaning. 78% of patients came from outside the town of Aguié (rural area). This strong tendency to live in rural areas was also found among (Malle S. *et al.*) 75.40%. This could be explained by the fact that the Aguié district hospital is the referral facility for the 11 CSIs in the district, and also receives serious cases from other surrounding hospitals. The majority of patients were admitted to the malnutrition management programme and to the ward for severe emaciation (marasmic form). In this respect, 30% had a PB less than or equal to 115 mm, 59% had a P/T less than 3 Z score and 11% were admitted for nutritional oedema. Our results are identical to those of the majority of authors who find that the marasmic form is in the majority (A Bah *et al.*, 2021), (J. NDIE *et al.*, 2017).

In our study, the peak of hospitalisation of patients was in August and September respectively 16% and 16% followed by October 13%. Our result is almost similar to that of (A. Bah *et al.*, 2021) who found a peak in (July, August and September 2017). This situation could be explained by the wintering and lean season in Niger and specifically in the Aguié district. In our series, the first reason for consultation was diarrhoea 41.50%, as in (A. Bah *et al.*, 2021) 49.60% and (Savadogo AS *et al.*) 50.50%. Malnutrition is frequently associated with infections due to reduced immunity, which can lead to gastrointestinal disorders. Among the complications encountered on admission, gastroenteritis was the most frequent, accounting for 45.70% of cases. Our results are identical to those of Anne-Laure Page *et al.*, who found a predominance of gastroenteritis 49.5%. In our study, 88% of patients were successfully treated (favourable outcome) and referred to CRENAS for further treatment. Our result is higher than that of (J. NDIE *et al.*, 2017) 72.9% and (BOULOUMEGNE MOUBITANG *et al.*) 60%. This

high rate of successful treatment could be explained by the dynamism of the staff and the support of a partner for management. The drop-out rate was 3%. Our result is well below the acceptable standard according to the protocol (PCIMA Niger, 2016) 15%. In our study we observed 9% deaths. Our result is lower than the standard for quality of care in a nutrition programme in Niger, which should be less than 10% (PCIMA Niger 2016 P 120), and that of (A. Bah *et al.*, 2021) 11.6%, (Félicité Nguefack *et al.*) 21.9%. Our result could be explained by the delay in seeking care and the serious condition.

## CONCLUSION

Severe acute malnutrition remains a real problem in the Aguié health district. Raising community awareness and strengthening preventive measures will help to reduce its prevalence and mortality in the district.

**Conflicts of interest:** None

## REFERENCES

- Sommer, A. P. (2010). Les défis posés par la malnutrition: faits et chiffres.
- OMS. (2021). <https://www.who.int/fr/news-room/fact-sheets/detail/malnutrition> (Consulté le 07/06/2021 à 14 40 mn).
- Ngallaba, S. E., Makerere, D. J., Kapesa, A., Mongela, S., & Namanya, B. (2014). Outcome and Effectiveness of Inpatient Care of Malnourished under Five Children in District Hospitals of Mwanza Region, North Western Tanzania. *Open Journal of Preventive Medicine*, 4(5), 293-298.
- Abate, H. K., Kidane, S. Z., Feyessa, Y. M., & Gebrehawariat, E. G. (2019). Mortality in children with severe acute malnutrition. *Clinical nutrition ESPEN*, 33, 98-104.
- RAPPORT SMART. (2021). Enquête Nutritionnelle Et De Mortalité Retrospective Au Niger, Décembre 2021, P 47.
- PCIMA Niger, 2016, 49-50.
- Bah, A. Bagayoko, T. B., Kassogué, A., Guindo, M., Harber, B., Coulibaly, N., Thiéro, A., Kanté, M., Samaké, B., Keita, M., Koné, S. I., Traoré, T., Coulibaly, M., Diallo, M., Coulibaly, D. S., Sanogo, A., Fofana, A., Togo, M. A., Coulibaly, A. N., & Diallo, S. (2021). Etude de la prévalence de la malnutrition aigüe sévère avec complication chez les enfants de 6 à 59 mois à l'hôpital Nianankoro Fomba de Ségou. *Mali Santé Publique*, 11(2), 43-48.
- Sangho, O., Doumbia, A., Samaké, M. N., Traore, F. B., Traoré, M., & Iknane, A. A. (2013). Prévalence de la malnutrition aigüe chez les enfants de 0- 59 mois dans un district sanitaire de Barouéli. *Mali Santé Publique*, 3(1), 43-48.
- Traoré, F., Maiga, B., Diall, H., Sissoko, S., Sacko, K., Konaté, D., ... & Togo, B. (2020). Prise en charge de la malnutrition aigue chez l'enfant dans

un hôpital secondaire sahélien. *Mali Médicale*, 35(2), 32-37.

- Kangaye, S., Moumouni, K., Ibrahim, A., Soumana, A., Ousman, M., Moumouni, H., & Sadou, H. (2019). Correlation Entre les Motifs d'hospitalisation et l'état Nutritionnel chez les Enfants Âgés de 6-59 Mois Hospitalisés en Urgence Pédiatrique dans deux Hôpitaux de Référence de Niamey, Niger en 2016, *European Scientific Journal*, 15(9), 214-227.
- Zoungrana, B., Sawadogo, P. S., Somda, N. S., Tapsoba, F., Tankoano, A., & Savadogo, A. (2019). Performance et coût de la prise en charge de la malnutrition aiguë sévère avec complications à Kaya, Burkina Faso. *The Pan African Medical Journal*, 34, 145.
- Ndié, J., Tchabda, R., Tchanga, B., Wina, P., Takoukam, I., Bayoro, I., & Awono Ateba, P. E. (2017). Aspects épidémiologiques de la malnutrition aiguë sévère au centre nutritionnel et thérapeutique interne (CNTI) du District de Santé de Tcholliré. *Med. Afr. noire (En ligne)*, 57-64.
- Malle, S. (2017). Malnutrition aiguë sévère: Aspects épidémiologique, clinique et thérapeutique des enfants de 6 – 59 mois à l'URENI du Centre de Santé de Référence de Koutiala (République du Mali), Thèse Med, USTTB, MALI.
- Savadogo, A. S. (2010). La malnutrition chez les enfants de 0 à 5ans à l'hôpital Nianankoro Fomba de Ségou. Thèse Med, USTTB, MALI.
- Page, A. L., de Rekeneire, N., Sayadi, S., Aberrane, S., Janssens, A. C., Rieux, C., ... & Baron, E. (2013). Infections in children admitted with complicated severe acute malnutrition in Niger. *PloS one*, 8(7), e68699.
- Bouloumagne Moubitang, G., & Chounfack, E. (2014). Prévalence de la malnutrition aiguë chez les enfants de 6 à 59 mois et issue de la prise en charge des enfants malnutris à la pédiatrie de l'Hôpital Régional de Garoua. *African Journal for Epidemiology*, 2(1).
- Nguefack, F., Adjahoung, C. A., Keugoung, B., Kamgaing, N., & Dongmo, R. (2015). Prise en charge hospitalière de la malnutrition aiguë sévère chez l'enfant avec des préparations locales alternatives aux F-75 et F-100: résultats et défis. *Pan African Medical Journal*, 21(1), 329-332.